PROC. ENTOMOL. SOC. WASH.
83(3), 1981, pp. 428–431

NOTES ON FOOD RESOURCES AND BEHAVIOR OF THE FAMILY COREIDAE (HEMIPTERA) IN A SEMI-DECIDUOUS TROPICAL FOREST

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Abstract.—Seventeen species of the family Coreidae were collected in a semi-deciduous tropical forest of Guanacaste Province, Costa Rica. Observations were made on the feeding behavior and food plants for 11 species. These observations indicated a remarkable specificity between the insects and plants. Other types of behavior, such as aggregation, and sex ratios are included when available.

While on an *Organization for Tropical Studies* (OTS) Tropical Biology course (77-1), the senior author made observations on the food habits and behavior of the family Coreidae at Hacienda Palo Verde, Guanacaste Province, Costa Rica (10°20′S, 85°24′W) in the early part of July 1976.

The study area comprises a short range of limestone hills about 100 m high along the north side of the Río Tempisque flood plain. The OTS field station at Palo Verde is located at the base of these hills. The vegetation forms a mosaic of mature, semi-deciduous forest on the hillsides, with some secondary woody growth and open pasture in more level places. Cattle graze freely throughout the area, although access to the steeper rocky areas is limited by the terrain.

Characteristic woody plants of the forest and secondary growth are: *Acacia collinsii* Safford; *A. farnesiana* (L.) Willd.; *Astronium graveolens* Jacq.; *Bursera simarouba* (L.) Sarg.; *Calycophyllum candidissimum* (Vahl.) DC.; *Casearia corymbosa* HBK.; *Guazuma ulmifolia* Lam.; *Lonchocarpus costaricensis* Pittier; *Luehea candida* (Moc. and Sesse ex DC.) Mart. and Zucc.; *Myrospermum frutescens* Jacq.; *Pterocarpus rohrii* Vahl.; *Randia subcordata* Standl.; *Spondias mombin* L.; *Stemmadenia obovata* (Hook. and Arn.) K. Schum.; *Tabebuia chrysantha* (Jacq.) Nichols.; and *T. rosea* (Berthol.) DC.

During the observation period, midway through the rainy season, 11 of

Table 1. Food resources of Coreidae. Numbers in parentheses refer to collection numbers of the senior author; insect specimens deposited in the U.S. National Museum of Natural History, Washington, D.C. and identified by the junior author. Vouchers for the plant species are deposited at the Missouri Botanical Garden (MO), St. Louis, Missouri.

Species of Coreidae	Food Plant	No. Captured While			Sex		
		Feeding	Resting	Flying	Male	Female	Sex Ratio M/F
Acanthocephala declivis (Say) (38, 39, 46, 48)	*Pithecoctenium crucigerum* (L.) A. Gentry (Bignoniaceae)	4	4	3	5	6	—
Anasa bellator (Fabricius) (12, 35, 44)		—	2	—	—	2	—
Anasa scorbutica (Fabricius) (11)		—	—	1	—	1	—
Anisoscelis affinis Westwood (36)	*Passiflora* sp. (Passifloraceae) (L. Gilbert, pers. comm.)	—	1	—	1	—	—
Capaneus sp. (a) (4, 5)	*Acacia collinsii* Safford (Leguminosae)	1	2	1	2	2	—
Capaneus sp. (b) (13, 14)	*Stemmadenia obovata* (Hook. and Arn.) K. Schum. (Apocynaceae)	1	1	—	—	2	—
Capaneus odiosus Stål (32, 33, 34)	*Pachyrrhizus erosus* (L.) Urban (Leguminosae)	72	48	—	66	54	1/.82
Hirilcus sp. (21, 22)		—	2	—	1	1	—
Holymenia histrio (Fabricius) (19, 20)	*Passiflora platyloba* Killip (Passifloraceae)	2	—	—	—	2	—
Hypselonotus fulvus (De Geer) (6, 7, 51, 52, 53, 54, 55)	*Julocroton argenteus* (L.) Didr. (Euphorbiaceae)	74	41	—	26	89	1/3.4
Leptoglossus zonatus (Dallas) (23, 24, 45)		—	—	3	1	2	—
Machtima crucigera (Fabricius) (3)		—	—	—	—	—	—
Mozena sp. (a) (1, 2, 25)	*Acacia farnesiana* (L.) Willd. (Leguminosae)	102	57	2	98	63	1/.64
Mozena sp. (b) (4, 5)	*Pithecellobium oblongum* Benth. (Leguminosae)	3	9	2	8	6	—
Phthia picta (Drury) (30, 31)	*Julocroton argenteus* (L.) Dirdr. (Euphorbiaceae)	1	1	—	1	1	—
Savius jurgiosus Stål (8, 9, 10)		—	3	—	1	2	—
Stenoscelidea aenescens Stål (27, 28, 29)	*Lonchocarpus costaricensis* Pittier (Leguminosae)	16	22	—	20	18	1/.9

the 17 species of coreids collected were found to utilize eight genera of plants in six diverse familes for food (Table 1). The most striking aspect of the data was the high degree of specificity exhibited regarding food preference. Each coreid species was found feeding on one, and only one, species of plant.

Because of the extended dry season (6–7 months), we assume that most of the coreids modify their habits or change habitats with its onset. This may involve diapause, a change of food plant or particular plant part, high mortality with subsequent recolonization each wet season, or migration to a more suitable environment, e.g. gallery forest. The two species, *Anisocelis affinis* Westwood and *Holymenia histrio* (Fabricius), which are obligate feeders on *Passiflora* spp. (L. Gilbert, personal communication), do not change food plants, and thus, must utilize some other modification in their life histories to escape the dry season. *Capaneus* sp. (a), which feeds on *Acacia collinsii,* may not need to modify its feeding habits for the duration of the dry season. *Acacia collinsii* continues to flush new growth throughout the year because of its dependence on ants of the genus *Pseudomyrmex* (several species) for control of competition from other plants and protection from predation by herbivores (Janzen, 1974). The three individuals of *Capaneus* sp. (a) which were not flying when captured, were found feeding or resting on *A. collinsii* shrubs unoccupied by *Pseudomyrmex.*

Two other species are known to attack a wide variety of plants, including a number of economically important ones on which they may be serious pests. *Leptoglossus zonatus* (Dallas) has been reported to feed on corn, cotton, dates, oranges, pomegranates (transmits "heart rot" of this crop), peaches, sorghum, and watermelon; *Phthia picta* (Drury), which also feeds on *Solanum nigrum* L., damages tomato fruits and squash vines.

The coreids exhibited a wide range of aggregation behavior, from solitary to highly clumped. For example, *Mozena* sp. (a) (identified as *M. lunata* in Real et al., 1974) was abundantly distributed throughout areas of secondary growth, where its host species, *Acacia farnesiana,* is more or less restricted. However, not every plant of *A. farnesiana* was infested with individuals of *Mozena* sp. (a). In fact, many plants showed no evidence of feeding activity, as damaged twigs exhibit a characteristic wilted appearance. Wherever an individual of *Mozena* sp. (a) was found, other individuals, both adult and juvenile, were also likely to be found congregating on the same twig. A previous OTS study reported on a characteristic clumped distribution for this species (Real et al., 1974). In another study (Aldrich, 1975), an unidentified coreid feeding on *Pithecellobium oblongum* (*P. dulce*) (possibly *Mozena* sp. (b) in Table 1), was found to aggregate through some type of pheromone perception via the antennae. Aggregation behavior also seemed to be utilized by *Capaneus odiosus* Stål, since individuals tended to be clumped on various plant parts, e.g. young stems, old stems, or petioles;

however, this was not tested in any statistical manner. *Hypselonotus fulvus* (De Geer), which feeds on *Julocroton argenteus* in open pastures, was shown by Real et al. (1974) to be randomly distributed.

Sex ratios were determined for species in which adequate numbers of individuals were examined (Table 1). *Mozena* sp. (a) had a strong bias towards males, while most specimens of *Hypselonotus fulvus* were female. *Capaneus odiosus* and *Stenoscelidea aenescens* Stål also showed a slight preponderance of males. The strong bias in *Mozena* sp. (a) may be due to differential development times of each sex, as many nymphs were encountered.

In feeding and disturbance behavior, all of the species exhibited similar characteristics. Most fed on young shoots, buds, or inflorescences where the plant tissues are relatively soft and easily penetrated by the sucking mouth parts. The only exception to this was one individual of *Acanthocephalus declivis* (Say), which was observed feeding on a bark-covered stem of *Pithecoctenium crucigerum* about 4 cm in diameter. When disturbed, the normal response was to move to the opposite side of the leaf, twig, or stem, so as to hide from the source of disturbance. If the disturbance continued, the insect usually escaped by flying. All of the coreids exhibited strong, if somewhat slow and deliberate, flight.

Literature Cited

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